

HWRM-205

SOIL AND WATER CONSERVATION

(03 Credit hrs)

PRE-REQUISITE: HWRM-201

LEARNING OUTCOMES

Following are the learning outcomes of the course:

- Student will learn about Soil Water Conservation
- Student will learn about Rainfall -Runoff Processes
- Student will learn about Evaporation and Evapotranspiration
- Student will learn about Water Erosion
- Student will learn about Wind Erosion
- Student will learn about Watershed Management
- Student will learn about Vegetation and its Role to control Erosion

CONTENTS

This course will provide an insight learning of soil water conservation and sustainability of water resources.

THEORY

Unit-1 Soil Water Conservation

- 1.1. Soils types
- 1.2. Soil System
- 1.3. Functions of Soils,
- 1.4. Soil and water resources
- 1.5. Conservation ethics

Unit-II Rainfall -Runoff Processes

- 2.1. Rainfall and Runoff
- 2.2. Rainfall intensity and duration
- 2.3. Runoff process,
- 2.4. Factors affecting runoff
- 2.5. Design runoff rates
- 2.6. Infiltration
- 2.7. infiltration capacity
- 2.8. Factors affecting infiltration capacity
- 2.9. Evaporation & Transpiration
- 2.10. Factors affecting infiltration

Unit-III: Evaporation and Evapotranspiration

- 3.1. Evaporation
- 3.2. Types of evaporation
- 3.3. Transpiration and its Causes
- 3.4. Evapotranspiration,

3.5. Prediction of ET

Unit-IV: Water Erosion

- 4.1. Water Erosion
- 4.2. Erosion agents
- 4.3. Geologic and accelerated erosion
- 4.4. Damages caused by soil erosion
- 4.5. Water erosion and its types, Factors affecting water erosion,
- 4.6. Sedimentation and pollution in relation to water erosion
- 4.7. Water erosion prediction equation, Erosion control practices

Unit-V: Wind Erosion

- 5.1. Wind Erosion
- 5.2. Factors affecting wind erosion
- 5.3. Types of soil movement
- 5.4. Mechanics of wind erosion
- 5.5. Wind erosion control principles
- 5.6. Wind erosion prediction equation
- 5.7. Cropping System and Agronomic Measures for Erosion Control

Unit-VI: Watershed Management

- 6.1. Watershed management,
- 6.2. Plant cover
- 6.3. Crop rotation
- 6.4. Strip-cropping
- 6.5. Conservation tillage
- 6.6. Contour cultivation
- 6.7. Land capability classification
- 6.8. Terracing and Field terrace

Unit-VII: Vegetation and its Role to control Erosion

- 7.1. Classification of terraces
- 7.2. Broad base terraces
- 7.3. Bench terraces
- 7.4. Terrace design
- 7.5. Planning the terrace system,
- 7.6. Terrace construction and maintenance
- 7.7. Vegetated Outlet
- 7.8. Use of vegetated outlets and water courses in the control of erosion
- 7.9. Design of vegetated outlets
- 7.10. Water-way construction and maintenance

TEACHING – LEARNING STRATEGIES

- Lecture based examination

- Presentation/seminars
- Class discussion
- Quizzes

ASSIGNMENTS – TYPE AND NUMBER WITH CALENDAR

It is continuous assessment. The weightage of Assignments will be 25% before and after midterm assessment. It includes:

- classroom participation,
- attendance, assignments and presentation,
- homework
- attitude and behavior,
- hands-on-activities,
- short tests, quizzes etc.

ASSESSMENT AND EXAMINATIONS:

Sr. No.	Elements	Weightage	Details
1.	Mid Term Assessment	35%	It takes place at the mid-point of the semester
2.	Formative Assessment	25%	It is continuous assessment. It includes: classroom participation, attendance, assignments and presentation, homework, attitude and behavior, hands-on-activities, short tests, quizzes etc.
3.	Final Assessment	40%	It takes place at the end of the semester. It is mostly in the form of a test, but owing to the nature of the course the teacher may assess their students based on term paper, research proposal development, field work and report writing etc.

RECOMMENDED TEXT BOOKS / SUGGESTED READINGS

1. Huffman, R. L. (2013). *Soil & Water Conservation Engineering*, American Society of Agricultural and Biological Engineers. ISBN: 1892769867.
2. Pierce, E. J. and Fryer, W. W. (2018). *Advances in Soil & Water Conservation*, CRC Press.
3. Micheal, A. M. (2003). *Irrigation Theory and Practices*. Vikas Publishing House (Pvt), New Delhi.
4. Morgan, R.P.C. (2005). *Soil Erosion & Conservation*. Third Edition. Blackwell Pub. ISBN; 9781405117814
5. Schwab, G.O. (1993). *Soil & Water Conservation Engg- Fourth Edition*, John Willey & Sons, Inc.